ASSIGNMENT 7

Textbook Assignment: "Radiological Effects" and "Radiological Defense and Recovery," chapters 10 and 11.

Learning Objective: Recall the components of an atom.

7-1. An atom is made up of subatomic particles known as electrons, protons, and neutrons.

1. True
2. False

7-2. What number of electrons must be orbiting the nucleus of an atom for the electrical charge of the atom to remain neutral?

1. Ten
2. Twelve
3. Twenty
4. A number equal to the number of protons in the nucleus

7-3. What subatomic particle, if any, has a negative electrical charge?

1. Proton
2. Neutron
3. Electron
4. None

7-4. What subatomic particle, if any, has a positive electrical charge?

1. Electron
2. Proton
3. Neutron
4. None

7-5. What subatomic particle, if any, has no electrical charge?

1. Electron
2. Proton
3. Neutron
4. None

7-6. The process that causes the splitting of the nucleus of a heavy element that results in a gigantic explosion is known as

1. oxidation
2. ionization
3. amalgamation
4. fission

Learning Objective: Recall the different types of nuclear bursts and their effects.

7-7. Some of the effects of a nuclear burst occur in and last only microseconds, while others occur in microseconds but linger for days, months, or even years.

1. True
2. False

7-8. Approximately 50 percent of the energy released from a nuclear detonation below an altitude of approximately 100,000 feet produces blast and shock, about 35 percent produces thermal radiation, and about 15 percent produces nuclear radiation.

1. True
2. False

7-9. Of the energy released from a nuclear detonation below approximately 100,000 feet, 15 percent produces nuclear radiation. About 5 percent of this radiation is known as initial nuclear radiation and the other 10 percent is known as

1. supplemental nuclear radiation
2. secondary nuclear radiation
3. tertiary nuclear radiation
4. residual nuclear radiation

7-10. What type of nuclear radiation is delivered simultaneously with the detonation of a nuclear burst and cannot be avoided by maneuvering or evasive actions?

1. Residual
2. Supplemental
3. Initial
4. Thermal

7-11. What type of nuclear radiation is emitted over a long period of time, extending to days and years?

1. Thermal
2. Initial
3. Ionized
4. Residual

7-12. The size or energy yield of nuclear weapons is rated in terms of the amount of what other explosive required to release an equal amount of energy?

1. Nitroglycerine
2. TNT
3. Gunpowder
4. C4 plastic

7-13. A 1-megaton nuclear warhead is a weapon capable of releasing an amount of energy equal to the energy released by 1 million tons of what type of explosive?

1. Nitroglycerine
2. C4 plastic
3. Gunpowder
4. TNT

7-14. Which of the following factors has a major influence on the relative effect of a nuclear burst?

1. Humidity
2. Location
3. Air temperature
4. Delivery vehicle

7-15. The five classifications of nuclear detonations include airburst, high-altitude burst, surface burst, underwater burst, and underground burst.

1. True
2. False

7-16. An airburst is a burst where the fireball does not touch the surface of the earth and the detonation is below what altitude?

1. 130,000 feet
2. 120,000 feet
3. 110,000 feet
4. 100,000 feet

7-17. The important effects of high-altitude bursts are damage to weapons systems or satellites operating in the upper atmosphere or in space and interference with radar emissions and communications.

1. True
2. False

7-18. A surface burst produces initial nuclear radiation around surface zero (SZ) and residual nuclear radiation around SZ and downwind from SZ.

1. True
2. False

7-19. Transit radiation is airborne radioactive material (base surge/fallout) whereas deposit radiation is radioactive material (base surge/fallout) that settles on exposed surfaces.

1. True
2. False

7-20. For a given weapon yield, greater hull and machinery damage to a ship will be produced by shock from what type of nuclear burst?

1. Air
2. Surface
3. High altitude
4. Underwater

7-21. Water waves produced by an underwater burst should not be a major hazard to ships except in shoaling waters.

1. True
2. False

7-22. An underwater nuclear burst produces underwater shock and a water plume which then causes the formation of

1. a thunderstorm
2. an undertow
3. a base surge
4. a tornado

Learning Objective: Recall the different types of effects resulting from nuclear bursts.

7-23. The shock wave created by a nuclear air burst initially travels outward at a velocity that is approximately how many times the speed of sound?

1. Five
2. Six
3. Seven
4. Eight

7-24. Aircraft, masts, antennas, and exposed personnel are vulnerable to what type of overpressure from a nuclear air burst?

1. Static
2. Fixed
3. Dynamic
4. Rigid

7-25. Which of the following targets are more likely to sustain severe damage from the static overpressure from a nuclear airburst?

1. Radar and radio antennas
2. Ship structures and buildings
3. Airplanes and helicopters
4. Exposed personnel

7-26. Serious injuries to personnel result when overpressure from a nuclear air burst reach what level, in pounds per square inch?

1. 1
2. 2
3. 3
4. 5

7-27. The shock wave from an underwater nuclear burst produces rapid acceleration of a ship. This action can disarrange equipment and machinery, rupture hulls, and/or injure personnel.

1. True
2. False

7-28. Four factors determine if the greater damage to a ship will be caused by the direct shock wave or from the reflected shock wave produced by an underwater nuclear burst. Which of the following is NOT one of these factors?

1. Bottom configuration and structure
2. Ocean wave formations
3. Depth of water
4. Distance from burst

7-29. The reflected shock wave produced by a nuclear airburst disperses in a nearly vertical direction. This movement is very effective in producing the vertical motions that can severely damage a ship.

1. True
2. False

7-30. Where the sea bottom is essentially flat, the strength of a reflected wave from a nuclear underwater burst will depend on the bottom structure. What type of bottom structure produces the greater wave strength?

1. Mud
2. Sand
3. Rock
4. Silt

7-31. Thermal radiation from the nuclear fireball of a 1-MT warhead lasts for how many seconds?

1. 2 to 3
2. 4 to 5
3. 6 to 7
4. 8 to 9

7-32. When fog, haze, and clouds are above a nuclear burst and the target area, a significant amount of thermal radiation is reflected downward. This action increases the severity of burns received by personnel.

1. True
2. False

7-33. Which of the following particles is not one of the four basic types of nuclear radiation produced by a nuclear explosion?

1. Alpha particles
2. Beta particles
3. Gamma rays
4. Photons

7-34. What two forms of nuclear radiation have strong penetrating power and cause similar injuries to people?

1. Alpha and beta particles
2. Alpha and gamma rays
3. Gamma rays and neutrons
4. Neutron rays and beta particles

7-35. What term identifies radioactive material that has been deposited where it is not wanted and presents a hazard to personnel?

1. Alpha material
2. Radioactive contamination
3. Fission fallout
4. Fusion debris

7-36. Atmospheric ionization around a nuclear airburst above 100,000 feet can disrupt radio and radar signals for several hours.

1. True
2. False

7-37. What effect from a nuclear burst produces large currents in cables and long-lead wires that can burn out electronic and electrical equipment?

1. Ionization
2. Radioactive water
3. Thermal nuclear radiation
4. Electromagnetic pulse (EMP)

7-38. Initial nuclear radiation is that radiation emitted by the fireball and the cloud during the first minute after detonation.

1. True
2. False

7-39. What is the primary reason that fallout of any kind is a major hazard?

1. Because it emits alpha rays
2. Because it emits dangerous gases
3. Because it emits gamma rays
4. Because it causes minor burns

7-40. The militarily significant fallout, often called early fallout, is usually deposited in less than how many hours in an area downwind of the detonation site?

1. 60
2. 48
3. 36
4. 24

7-41. For approximately how long after the initial burst is the base surge highly contaminated with fission products, making it a source of intense transit radiation?

1. 90 minutes
2. 60 minutes
3. 30 minutes
4. 15 minutes

7-42. What classification is given to personnel unable to man a battle station because of an injury resulting from a nuclear blast?

1. Combat casualties (CCs)
2. Combat ineffectives (CIs)
3. Battle wounded (BWs)
4. Combat excused (CEs)

7-43. Underwater shock produces injury among topside and below-deck personnel by the rapid upward movement of the deck.

1. True
2. False

7-44. Direct burns are often called flash burns because the flash of thermal radiation from the fireball produces them.

1. True
2. False

Learning Objective: Recall the different types of RADIAC and dosimeter instruments and their design limitations.

7-45. What types of instruments are used on ships to detect and measure radiation?

1. Radiation, detection, indication, and counting (RADIAC)
2. Radiation, detection, identification, and computation (RADIAC)
3. Radiation, detection, indication, and control (RADIAC)
4. Radiation, detection, indication, and computation (RADIAC)

7-46. Nuclear radiation once present cannot be detected by any of the five senses.

1. True
2. False

7-47. Detailed information on RADIAC instruments is contained in *NSTM*,

1. chapter 060
2. chapter 070
3. chapter 080
4. chapter 090

7-48. The intensity of the radiation field and the total dose or quantity of radiation received per exposure or time interval are essential information when considering the effects of radiation on personnel.

1. True
2. False

7-49. The intensity of radiation is expressed as roentgens per hour or as rads per hour.

1. True
2. False

7-50. Radiation dosage is expressed in two values: the exposure dose measured in roentgens, and the absorbed dose that is measured in what units?

1. Newtons
2. Joules
3. Rads
4. Microns

7-51. What device provides the information necessary to calculate the approximate length of time personnel can safely remain in a radiological contaminated area?

1. RADIAC meter
2. Survey meter
3. Dosimeter
4. Radiation meter

7-52. What device measures the total radiation received by an individual?

1. RADIAC meter
2. Survey meter
3. Dosimeter
4. Radiation meter

7-53. What survey RADIAC device is capable of detecting beta and gamma radiation simultaneously when the beta shield is removed?

1. AN/PDR-65
2. AN/PDR-27
3. DT-60/PD
4. IM-9PD

7-54. The RADIAC meter for what unit is installed on the bridge with one or more auxiliary readouts located in DCC and other prime locations?

1. AN/PDR-43 survey meter
2. AN/PDR-27 survey RADIAC
3. AN/PDR-65 RADIAC set
4. IM-9PD dosimeter

7-55. The DT-60/PD is a gamma radiation dosimeter that has what usable range, in rads?

1. 10 to 600
2. 20 to 700
3. 30 to 750
4. 40 to 800

7-56. The CP-95A/PD is a RADIAC computer-indicator that is used to read the amount of radiation a DT-60/PD has been exposed to.

1. True
2. False

7-57. What RADIAC instrument is primarily a health-physics device that is particularly useful in areas of low dose rates?

1. IM-45/PD
2. IM-22/PD
3. IM-143/PD
4. IM-9/PD

7-58. What dosimeter device is used by repair locker personnel that are involved with the survey, monitoring, and decontamination details during CBR evolutions?

1. IM-45/PD
2. IM-22/PD
3. IM-143/PD
4. IM-9/PD

7-59. What device is used to reset the self-reading dosimeters to zero?

1. IM-1246D/PD dosimeter charger
2. DT-2216C/PD dosimeter charger
3. CP-3326B/PD dosimeter charger
4. PP-4276A/PD dosimeter charger

7-60. Most RADIAC instruments are capable of detecting and measuring beta and gamma radiation at the same time.

1. True
2. False

7-61. RADIAC equipment aboard ship is inspected as required by the

1. *NSTM*, chapter 44
2. *NSTM,* chapter 70
3. *Ships' Maintenance and Material Management (3-M) Manual*
4. *Ships' RADIAC PMS Manual*

7-62. Some RADIAC instruments have high voltage electronic circuits and some contain radioactive material. Each of these factors presents a potential hazard when the instruments are disassembled.

1. True
2. False

Learning Objective: Recall the different types of radiological surveys.

7-63. What type of radiological survey is performed immediately after the cessation of fallout?

1. Rapid external
2. Supplementary
3. Rapid internal
4. Detailed

7-64. What type of radiological survey is performed to obtain precise radiation levels at topside vital stations and at contaminated areas that are irradiating internal vital stations?

1. Detailed
2. Supplementary
3. Rapid internal
4. Rapid external

7-65. What type of radiological survey is conducted to confirm or revise stay time calculations?

1. Rapid external
2. Supplementary
3. Rapid internal
4. Detailed

7-66. Team members must remember that accuracy is more important than speed when they are conducting what type of survey?

1. Rapid external
2. Supplementary
3. Rapid internal
4. Detailed

Learning Objective: Recall the different types of radiological exposure control.

7-67. A half-thickness is the amount of a specific protective shielding material necessary to cut down the amount of radiation to one-half of its original value.

1. True
2. False

7-68. With each additional half-thickness shield of protective material, you reduce the remaining radiation by what percentage?

1. 80
2. 70
3. 60
4. 50

7-69. Which of the following material provides the greatest amount of protective shield against radiation?

1. Wood
2. Steel
3. Earth
4. Concrete

7-70. Each ship shall designate deep shelter for each battle station in the ship's CBR defense bill.

1. True
2. False

Learning Objective: Recall the requirements for personnel in execution of the decontamination process and the two types of decontamination stations.

7-71. Much of the contamination that results from a nuclear weapon detonation can NOT be removed with soap and water or by brushing.

1. True
2. False

7-72. Detailed information about decontamination stations is contained in what *NSTM* chapter?

1. 010
2. 050
3. 070
4. 080

7-73. All personnel exposed to the weather while a ship is receiving fallout from a nuclear detonation must enter the ship through a decontamination station or a contamination control area (CCA).

1. True
2. False

7-74. Decontamination stations that are not associated with a CPS are referred to as

1. emergency decon stations
2. conventional decon stations
3. supplementary decon stations
4. auxiliary decon stations

7-75. Ships that have a CPS with total protection (TP) zones have how many compartment decon stations in each zone that have access to the weather decks?

1. One
2. Two
3. Three
4. Four